

JAPAN

EDICT OF GOVERNMENT

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JIS A 5908 (2003) (English): Particleboards

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*The citizens of a nation must
honor the laws of the land.*

Fukuzawa Yukichi

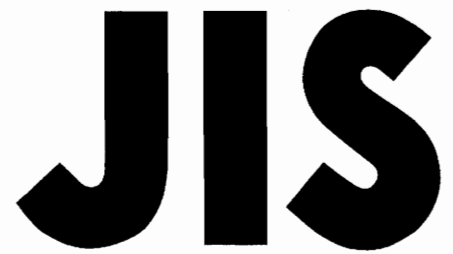
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INDUSTRIAL
STANDARD

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☞ JIS A 5908 : 2003

Particleboards

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS A 5908 : 1994** is replaced with **JIS A 5908 : 2003**.

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Particleboards

1 Scope This Japanese Industrial Standard specifies the boards which are formed mainly from wood particles⁽¹⁾ by hot pressing with adhesives (hereafter referred to as “particleboard”).

Note (1) The wood particles include chip, flake, wafer, strand, etc.

2 Normative references The standards shown in Attached Table 1 contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) shall be applied.

3 Classification and symbols The particleboard shall be classified as given below according to the condition of the face and back, bending strength, adhesives, emission quantity of formaldehyde, and incombustibility.

a) **Classification according to condition of face and back** Classification according to the condition of face and back shall be as specified in Table 1.

Table 1 Classification according to condition of face and back

Classification		Symbol	Condition of face and back
Base particleboard	Non-polished board	RN	Both sides are of base material, and non-polished.
	Polished board	RS	Both sides are of base material, and polished.
Veneered particleboard	Non-polished board	VN	Veneered on both sides of base particleboard, and non-polished.
	Polished board	VS	Veneered on both sides of base particleboard, and polished.
Decorative particleboard	Veneer overlay	DV	Decorative veneer is adhered to both sides or either side of base particleboard.
	Plastic overlay	DO	Sheet or film of synthetic resin type, impregnated paper of synthetic resin type, coat paper, after-coat paper or the like is adhered to both sides or either side of base particleboard, including non-patterned products where the decorative surface is finished in single colour and products with graining or abstract patterns.
	Coated	DC	Coating of synthetic resin type is heated and hardened, or printed on both sides or either side of base particleboard, including non-patterned products where the decorative surface is finished in single colour and products with graining or abstract patterns.

b) **Classification according to bending strength** Classification according to the bending strength shall be as specified in Table 2.

Table 2 Classification according to bending strength

Classification		Symbol	Bending strength
Base particleboard and decorative particleboard	Type 18	18	The bending strength shall be 18.0 N/mm ² or over both lengthwise and widthwise.
	Type 13	13	The bending strength shall be 13.0 N/mm ² or over both lengthwise and widthwise.
	Type 8	8	The bending strength shall be 8.0 N/mm ² or over both lengthwise and widthwise.
Base particleboard	Type 24-10	24-10	The bending strength shall be 24.0 N/mm ² or over lengthwise and 10.0 N/mm ² or over widthwise.
	Type 17.5-10.5	17.5-10.5	The bending strength shall be 17.5 N/mm ² or over lengthwise and 10.5 N/mm ² or over widthwise.
Veneered particleboard	Type 30-15	30-15	The bending strength shall be 30.0 N/mm ² or over lengthwise and 15.0 N/mm ² or over widthwise.

Remarks : Type 24-10 means the board of the orientation strand (OSB) type, and Type 17.5-10.5 means the board of wafer type.

- c) **Classification according to adhesives** Classification according to the adhesives shall be as specified in Table 3.

Table 3 Classification according to adhesives

Classification	Symbol	Adhesive	Main use (informative)
Type U	U	Urea resin type or at least equivalent in performance.	Suitable for furniture and cabinets.
Type M	M	Urea-melamine resin condensation type or at least equivalent in performance.	Suitable for floor substrates, roof substrates, inner and outer wall substrates, fixture materials or the like.
Type P	P	Phenolic resin type or at least equivalent in performance.	

- d) **Classification according to emission quantity of formaldehyde** Classification according to the emission quantity of formaldehyde shall be as specified in Table 4.

Table 4 Classification according to emission quantity of formaldehyde

Classification	Symbol	Emission quantity of formaldehyde	
		mean	maximum
F☆☆☆☆	F☆☆☆☆	0.3 mg/L or under	0.4 mg/L or under
F☆☆☆	F☆☆☆	0.5 mg/L or under	0.7 mg/L or under
F☆☆	F☆☆	1.5 mg/L or under	2.1 mg/L or under

- e) **Classification according to incombustibility** Classification according to the incombustibility shall be as specified in Table 5.

Table 5 Classification according to incombustibility

Classification	Symbol
Incombustibility grade 2	Incombustibility 2
Incombustibility grade 3	Incombustibility 3
Regular	—

4 Shapes, dimensions and tolerances Shapes, dimensions and tolerances shall be as specified below. However, the dimensions of the made-to-order product shall be subjected to the agreement between the parties concerned with delivery, and the tolerances and the squareness shall be as specified in Table 7.

- a) **Thickness** The thickness shall be as specified in Table 6.

Table 6 Thickness

Unit: mm

Thickness	9, 10, 12, 15, 18, 20, 25, 30, 35, 40
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Remarks : The thickness of the base particleboards of Type 24-10 and Type 17.5-10.5 may be 9.5 mm, 11 mm, 12.7 mm, 16 mm, 19 mm and 28.5 mm.

- b) **Width and length** The width and length shall be as specified in Fig. 1.

Unit : mm

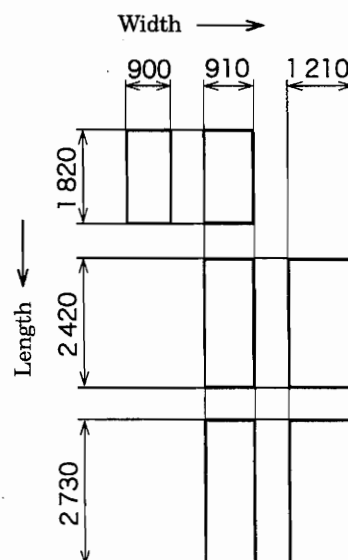


Fig. 1 Width and length

Remarks : The width and the length of the base particleboards of Type 24-10 and Type 17.5-10.5 may be 1 220 mm and 2 440 mm respectively.

- c) **Tolerances and squareness** The tolerances and squareness shall be as specified in Table 7.

Table 7 Tolerances and squareness

Unit: mm

Classification	Thickness	Tolerances on thickness			Tolerances on width and length	Squareness
		Non-polished board	Polished board	Decorative board		
Base particleboard and veneered particleboard	Under 15	± 1.0	± 0.3	—	± 3.0	2 max.
	15 or over to and excl. 20	± 1.2				
	20 or over	± 1.5				
Decorative particleboard	Under 18	—	—	± 0.5		
	18 or over	—	—	± 0.6		

Remarks : The thickness of the decorative particleboard means the thickness of the substrate added by the thickness of the decorative layer.

5 Appearance and quality

5.1 Appearance The appearance shall be as specified below:

- a) The surfaces of the particleboards shall be free from noticeable unevenness, stains, exfoliations, etc., and any distortion or warpage detrimental to use, shall not be observed. The decorative particleboard shall be free from the defects as indicated in Table 8.

Table 8 Appearance of decorative particleboard

Classification of defects	Standard
Chippings ⁽²⁾ , cracks or peelings	No defects shall be observed.
Distortion or warpage	No defects detrimental to use shall be observed.
Unevenness except for decorative purpose, dents, stains, flaws or mixing of foreign matters	Defects shall not be noticeably observed when visually checked at the position of 60 cm apart.
Irregular patterns, gloss and colour tone except for decorative purpose	Defects shall not be observed when visually checked at the position of 2 m ⁽³⁾ apart.

Notes ⁽²⁾ To mean the chipping of the substrates and decorative layers.

⁽³⁾ To carry out the checking simultaneously with several test pieces arranged.

- b) The section of the particleboard shall be excellent, and the side shall be square to the surface, except those whose sides are machined for the special purpose.

5.2 Quality The particleboard shall be tested on the quality items as indicated in Table 9 in accordance with test method in clause 6 and shall meet the requirements of Tables 10, 11, 12 and 13.

Table 9 Quality items

Quality item		Base particleboard and veneered particleboard			Decorative particleboard			Applicable subclause
		Type U	Type M	Type P	Type U	Type M	Type P	
Dimensions and squareness		○	○	○	○	○	○	6.2
Density		○	○	○	○	○	○	6.3
Water content		○	○	○	○	○	○	6.4
Bending strength		○	○	○	○	○	○	6.5
Bending strength under wet conditions ⁽⁴⁾	Test A	—	○	—	—	○	—	6.6
	Test B	—	—	○	—	—	○	
Swelling in thickness after immersion in water ⁽⁴⁾		—	○	○	—	○	○	6.7
Internal bond		○	○	○	○	○	○	6.8
Wood screw holding power ⁽⁵⁾		○	○	○	○	○	○	6.9
Emission quantity of formaldehyde		○	○	○	○	○	○	6.10
In-plane tensile strength		—	—	—	○	○	○	6.11
Impact resistance		—	—	—	○	○	○	6.12
Acid resistance ⁽⁶⁾		—	—	—	○	○	○	6.13
Alkali resistance ⁽⁶⁾		—	—	—	○	○	○	6.14
Stain resistance ⁽⁶⁾		—	—	—	○	○	○	6.15
Change-in-colour resistance ⁽⁶⁾		—	—	—	○	○	○	6.16
Scratch resistance ⁽⁶⁾		—	—	—	○	○	○	6.17
Thermal insulation		To be subjected to the agreement between the parties concerned with delivery.						6.18
Incombustibility ⁽⁷⁾		○	○	○	○	○	○	6.19

Notes ⁽⁴⁾ Not to be applied to Type 8.

⁽⁵⁾ The wood screw holding power shall be applied to the thickness of 15 mm or over.

⁽⁶⁾ Not to be applied to the veneer overlay nor after-coat papers.

⁽⁷⁾ To be applied to the particleboard having incombustibility.

Table 10 Quality

Classification			Density g/cm ³	Mois- ture content %	Bending strength N/mm ²		Bending strength under wet condi- tions ⁽⁴⁾ N/mm ²		Swelling in thickness after immersion in water ⁽⁴⁾ %	Internal bond N/mm ²	Wood screw holding power N	Emission quantity of formaldehyde mg/L	Bending Young's modulus (informa- tive) N/mm ²
					Length- wise	Width- wise	Length- wise	Width- wise					
Base particleboard, decorative particleboard	Type 18	F☆☆☆☆	0.40 or over up to and incl. 0.90	5 or over up to and incl. 13	18.0 min.		9.0 min.		12 max.	0.3 min.	500 min.	mean 0.3 or under maximum 0.4 or under	3 000 min. widthwise
		F☆☆☆										mean 0.5 or under maximum 0.7 or under	
		F☆☆										mean 1.5 or under maximum 2.1 or under	
	Type 13	F☆☆☆☆			13.0 min.		6.5 min.			0.2 min.	400 min.	mean 0.3 or under maximum 0.4 or under	2 500 min. widthwise
		F☆☆☆										mean 0.5 or under maximum 0.7 or under	
		F☆☆										mean 1.5 or under maximum 2.1 or under	
	Type 8	F☆☆☆☆			8.0 min.		—			0.15 min.	300 min.	mean 0.3 or under maximum 0.4 or under	2 000 min. widthwise
		F☆☆☆										mean 0.5 or under maximum 0.7 or under	
		F☆☆										mean 1.5 or under maximum 2.1 or under	

Table 10 (concluded)

Classification			Density g/cm³	Mois- ture content %	Bending strength N/mm²		Bending strength under wet condi- tions ⁽⁴⁾ N/mm²		Swelling in thickness after immersion in water ⁽⁴⁾ %	Internal bond N/mm²	Wood screw holding power N	Emission quantity of formaldehyde mg/L	Bending Young's modulus (informa- tive) N/mm²
					Length- wise	Width- wise	Length- wise	Width- wise					
Base particleboard	Type 24-10	F☆☆☆☆	0.40 or over up to and incl. 0.90	5 or over up to and incl. 13	24.0 min.	10.0 min.	12.0 min.	5.0 min.	When the thickness is 12.7 mm or under, the required value shall be 25 or under. When the thickness is over 2.7 mm, the required value shall be 20 or under.	0.3 min.	500 min.	mean 0.3 or under maximum 0.4 or under	4 000 min. lengthwise, 1 300 min. widthwise
		F☆☆☆										mean 0.5 or under maximum 0.7 or under	
		F☆☆										mean 1.5 or under maximum 2.1 or under	
	Type 17.5- 10.5	F☆☆☆☆			17.5 min.	10.5 min.	8.8 min.	5.3 min.				mean 0.3 or under maximum 0.4 or under	3 000 min. lengthwise, 2 000 min. widthwise
		F☆☆☆										mean 0.5 or under maximum 0.7 or under	
		F☆☆										mean 1.5 or under maximum 2.1 or under	
Veneered particleboard	Type 30-15	F☆☆☆☆			30.0 min.	15.0 min.	15.0 min.	7.5 min.	12 max.			mean 0.3 or under maximum 0.4 or under	4 000 min. lengthwise, 2 800 min. widthwise
		F☆☆☆										mean 0.5 or under maximum 0.7 or under	
		F☆☆										mean 1.5 or under maximum 2.1 or under	

Remarks : Lengthwise means the longitudinal direction, while widthwise means the direction orthogonal thereto. In the case of the veneered particleboard, lengthwise means the direction of the fibres of the veneer, and widthwise means the direction orthogonal thereto.

Table 11 Quality of decorative particleboard

Moisture content %	In-plane tensile strength N/mm ²	Impact resistance	Acid resistance	Alkali resistance	Stain resistance	Change-in-colour resistance		Scratch resistance
					Stain resistance against the crayon (red)	Appearance	Colour difference	
5 or over up to and incl. 13	0.4 min.	To be free from the radial cracks, fracture and peeling of the decorative layer, and the diameter of recesses to be 20 mm or under.	No dis- coloration shall be observed.	No dis- coloration shall be observed.	To be of Gray scale 3 or over	To be free from defects such as crazing and swell on the surface.	To be of Gray scale 4 or over, or of colour difference 3.0 or under	No noticeable scratches shall be observed.

Remarks : The acid resistance, the alkali resistance, the stain resistance, the change-in-colour resistance and the scratch resistance are not applied to the veneer overlay nor after-coat.

Table 12 Thermal insulation

Thickness mm	Thermal resistance m ² •K/W	Thickness mm	Thermal resistance m ² •K/W
10	0.060 or over	25	0.155 or over
12	0.077 or over	30	0.181 or over
15	0.095 or over	35	0.215 or over
18	0.112 or over	40	0.241 or over
20	0.120 or over		

Remarks : The thermal resistance value which is not indicated in Table 12 shall be obtained by the proportional interpolation.

Table 13 Incombustibility

Classification	Incombustibility
Incombustibility grade 2	Incombustibility grade 2
Incombustibility grade 3	Incombustibility grade 3
Regular	—

6 Test methods

6.1 Test pieces

6.1.1 Sampling of test piece The test pieces of the dimensions and the number specified in Table 14 shall be sampled for every test item from the portion in the vicinity of the centre of the original board except the peripheral part of the sample.

In the case of the decorative board with grooves on the decorative surface, the test piece shall be sampled including the groove part.

6.1.2 Conditioning of test piece The test pieces shall be kept under air-dry condition⁽⁸⁾ or those which reach the constant weight⁽⁹⁾ at the temperature 20 ± 2 °C, and the humidity (65 ± 5) %. The test piece to be used for the formaldehyde emission test shall be in accordance with 7.3 of JIS A 1460.

Notes (8) The air-dry condition mentioned here means the condition of the test pieces which have been left in a well-ventilated room for seven days or more.

(9) The constant weight means the value where the mass is measured for every 24 h, and the rate of change reaches 0.1 % or under.

Table 14 Dimensions and number of test pieces

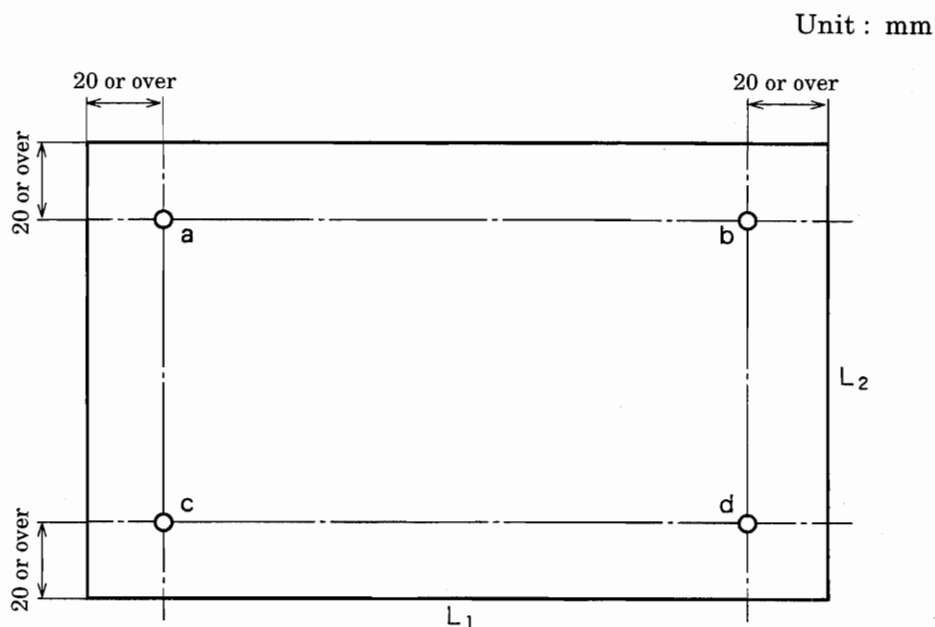
Test item	Dimensions of test piece mm	The number of test pieces to be sampled from one board
Density test	100 × 100	1
Moisture content test	100 × 100	1
Bending strength test	Width 50 × length [span ⁽¹⁰⁾ + 50]	Lengthwise 1, widthwise 1
Bending strength test under wet conditions	Width 50 × length [span ⁽¹⁰⁾ + 50]	Lengthwise 1, widthwise 1
Test of swelling in thickness after immersion in water	50 × 50	1
Internal bond test	50 × 50	1
Test of wood screw holding power	50 × 100	1
Formaldehyde emission test	50 × 150	Two sets of the number where the total surface area of the test piece including the butt ends is close to 1 800 cm ² (the fraction of 5 and over shall be counted as a unit and the rest be disregarded) shall be used.
In-plane tensile strength test	50 × 50	1
Impact resistance test	300 × 300	1
Acid resistance test	100 × 100	1
Alkali resistance test	100 × 100	1
Stain resistance test	100 × 100	1
Change-in-colour resistance test	150 × 150	1 ⁽¹¹⁾
Scratch resistance test	50 × 50	1
Thermal insulation test	900 × 900	1
Incombustibility test	220 × 220	1

Notes ⁽¹⁰⁾ The span shall be 15 times the nominal thickness, and 150 mm or over at the same time.

⁽¹¹⁾ 3 test pieces shall be prepared for the pattern board.

6.2 Measurement of dimensions and squareness The measurement of the dimensions and squareness shall be as specified below:

6.2.1 Thickness The thickness shall be measured at four points of 20 mm or over inside the peripheral sides as indicated in Fig. 2 by means of a measuring device having the accuracy of $\frac{1}{20}$ mm or finer, and the mean value of four measured values shall be employed. The part where the measuring device contacts with the surface of the sample shall be a circle of 6 mm or over in diameter. The convex part shall be measured in the case where unevenness is provided for the purpose of decoration.



○: measuring point of thickness: four points at four corners (a, b, c, d) of 20 mm or over inside each side

Fig. 2 Measurement of thickness of product to be shipped

6.2.2 Width and length The width and length shall be measured by using a measuring device having the accuracy of 1 mm or finer. The measuring points of the width and length shall be about 100 mm inside the peripheral sides as indicated in Fig. 3, and the width and length are measured at two points parallel to each side respectively, and defined as the means value of the measured values.

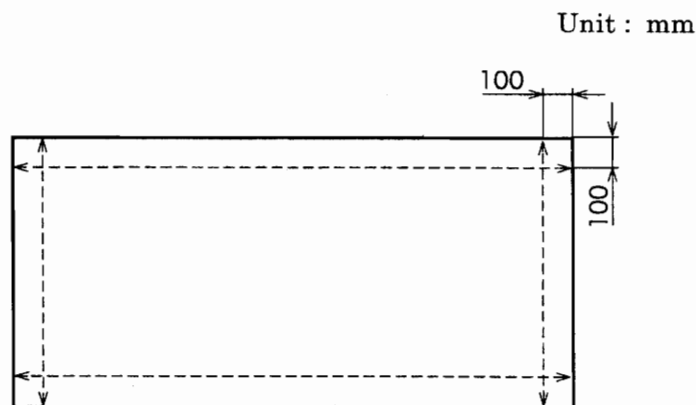


Fig. 3 Measurement of width and length of product

6.2.3 Squareness In defining the squareness, a sample shall be placed against the square of nominal size 1 000 of flat section square Grade 1 specified in **JIS B 7526** as indicated in Fig. 4, and the clearance (δ) to be generated between the square and the sample at the part of 1 000 mm apart from the corner shall be measured at four corners by means of a measuring device having the accuracy of 0.5 mm or finer.

When the side length (l) of the sample is under 1 000 mm, the clearance (δ) shall be measured at the end part of the side length, and the measured value shall be converted by the following formula:

$$\text{Converted clearance (mm)} = \frac{1\,000\delta}{l}$$

where, l : side length (mm) of the sample
 δ : clearance (mm)

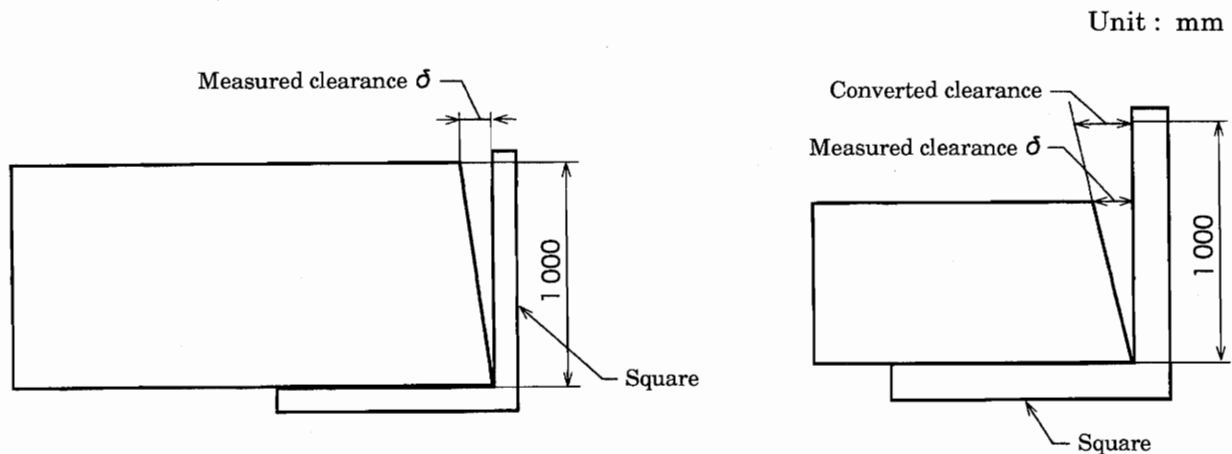


Fig. 4 Measurement of squareness

6.3 Density test Measure the lengths, widths and thicknesses of the points to be measured as shown in Fig. 5 and obtain their respective mean values to make them the length, width and thickness of the test piece with which the volume (V) is calculated. Then, measure the mass (m_1), and calculate the density by the formula below. In this case, the thickness, length, width and mass shall be measured to the nearest 0.05 mm, 0.1 mm, 0.1 mm and 0.1 g respectively, and the density shall be calculated to the nearest 0.01 g/cm³.

$$\text{Density (g/cm}^3\text{)} = \frac{m_1}{V}$$

where, m_1 : mass (g)
 V : volume (cm³)

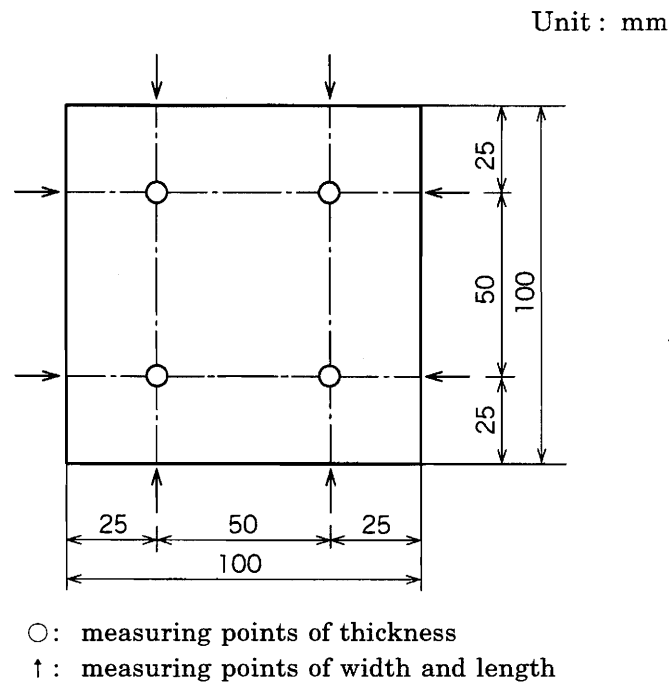


Fig. 5 Points to be measured of length, width and thickness

6.4 Moisture content test Measure the mass (m_1) of a test piece, put it in an air drier kept at 103 ± 2 °C, measure the mass (m_0) when it has constant mass, and obtain the moisture content to the tenth's place by the following formula:

$$\text{Moisture content (\%)} = \frac{m_1 - m_0}{m_0} \times 100$$

where, m_0 : mass (g) after drying
 m_1 : mass (g) before drying

6.5 Bending strength test Using the test apparatus shown in Fig. 6, apply a load of approximately 10 mm/min at a mean deformation speed from the surface of the test piece, and measure the maximum load (P). Calculate the bending strength of individual test pieces from the formula below.

In the case of the particleboards Type 18, Type 13 and Type 8, the smaller value of the bending strengths measured lengthwise and widthwise shall be adopted as the bending strength of the test piece, while for Type 24-10, Type 17.5-10.5 and Type 30-15, the bending strengths in both directions shall be adopted as the bending strength of the test piece.

$$\text{Bending strength (N/mm}^2\text{)} = \frac{3PL}{2bt^2}$$

where, P : maximum load (N)
 L : span (mm)
 b : width of test piece (mm)
 t : thickness of test piece (mm)

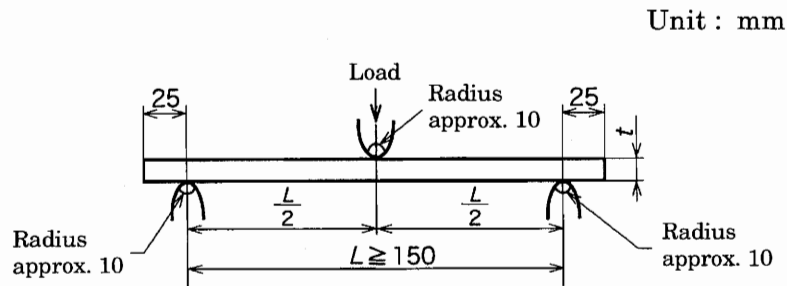


Fig. 6 Test apparatus of bending strength

6.6 Bending strength test under wet conditions Bending strength test under wet conditions shall be as specified below:

- a) **Bending strength test A under wet conditions** Immerse test pieces in warm water of 70 ± 3 °C for 2 h, and after further immersing them in water of ordinary temperature for 1 h, carry out the bending strength test specified in 6.5 as they are still wet. Calculate the bending strength under wet conditions of individual test pieces.

In the case of the particleboards Type 18 and Type 13, the smaller value of the bending strengths measured lengthwise and widthwise shall be adopted as the bending strength of the test piece, while for Type 24-10, Type 17.5-10.5 and Type 30-15, the bending strengths in both directions shall be adopted as the bending strength of the test piece. In calculating the bending strength under wet conditions, the dimensions of the test pieces before immersion shall be adopted.

- b) **Bending strength test B under wet conditions** Immerse test pieces in boiling water for 2 h, and after further immersing them in water of ordinary temperature for 1 h, carry out the bending strength test specified in 6.5 as they are still wet. Calculate the bending strength under wet conditions of individual test pieces.

In the case of the particleboards Type 18 and Type 13, the smaller value of the bending strengths measured lengthwise and widthwise shall be adopted as the bending strength of the test piece, while for Type 24-10, Type 17.5-10.5 and Type 30-15, the bending strengths in both directions shall be adopted as the bending strength of the test piece. In calculating the bending strength under wet conditions, the dimensions of the test pieces before immersion shall be adopted.

6.7 Test of swelling in thickness after immersion in water Measure the thickness in the centre of a test piece to the nearest 0.05 mm with a dial gauge or a micrometer, and then immerse it in water of 20 ± 1 °C horizontally about 3 cm below the water surface for 24 h, take it out, wipe off the water and measure the thickness again in the same manner as above. Calculate the swelling in thickness after immersion in water from the formula below:

$$\text{Swelling in thickness after immersion in water (\%)} = \frac{t_2 - t_1}{t_1} \times 100$$

where, t_1 : thickness (mm) before immersion in water
 t_2 : thickness (mm) after immersion in water

6.8 Internal bond test Adhere a test piece to steel or aluminum blocks shown in Fig. 7, apply a tension load vertically to the board face, measure the maximum load (P') at the time of failing force (breaking load of perpendicular tensile strength to the board), and calculate the internal bond from the formula below.

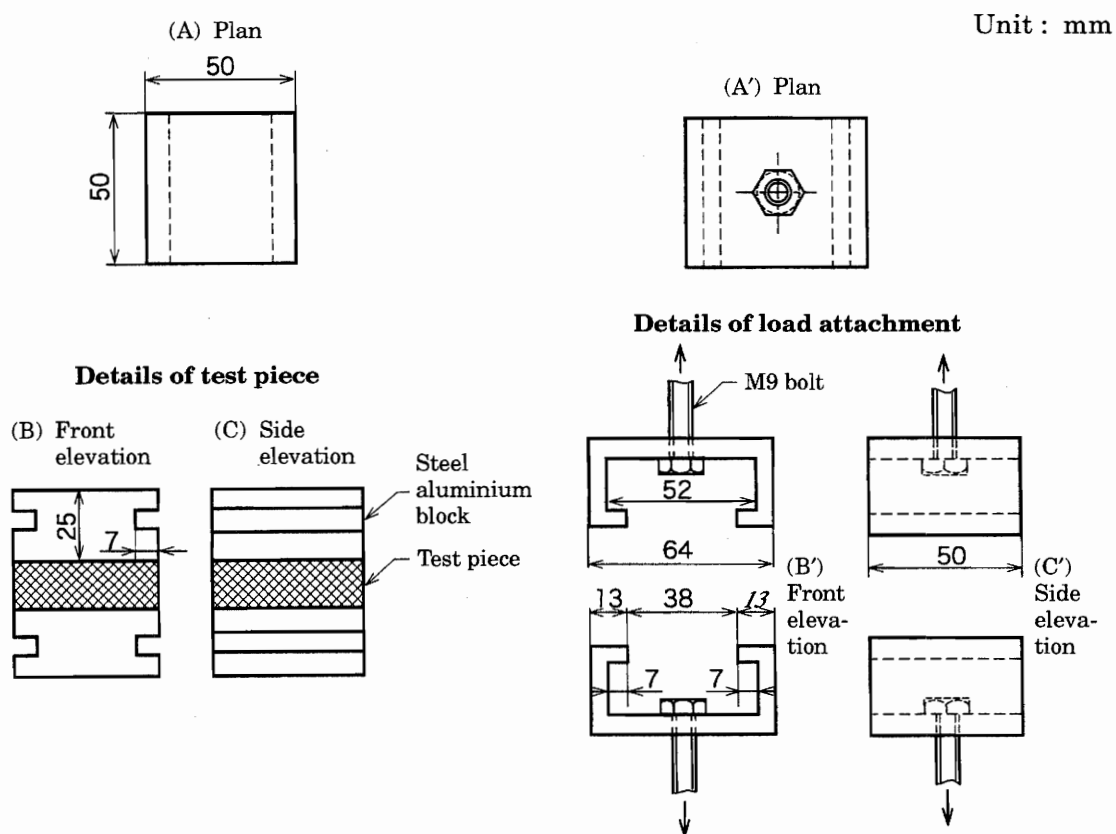
In this test, the tension loading speed shall be approximately 2 mm/min.

$$\text{Internal bond (N/mm}^2\text{)} = \frac{P'}{2bL}$$

where, P' : maximum load (N) at the time of failing force

b : width (mm) of sample

L : length (mm) of sample



Information : For the adhesion of the steel or aluminium block to the test piece, it is preferable to use an epoxy series resin or hot melt adhesive.

Fig. 7 Test apparatus of internal bond

6.9 Test of wood screw holding power Screw in⁽¹²⁾ the threaded part (approximately 11 mm) of the wood screw of 2.7 mm in nominal diameter and 16 mm in nominal length specified in **JIS B 1112**, into the two positions in test pieces vertically as shown in Fig. 8, pull out the screws vertically after fixing the test piece, measure the maximum loads required for pulling out, and consider the mean value of the two operations the wood screw holding power. In this test, the pulling-out load speed shall be approximately 2 mm/min.

Note (12) Guide holes of about 3 mm deep should be made by using a drill of 2 mm in diameter.

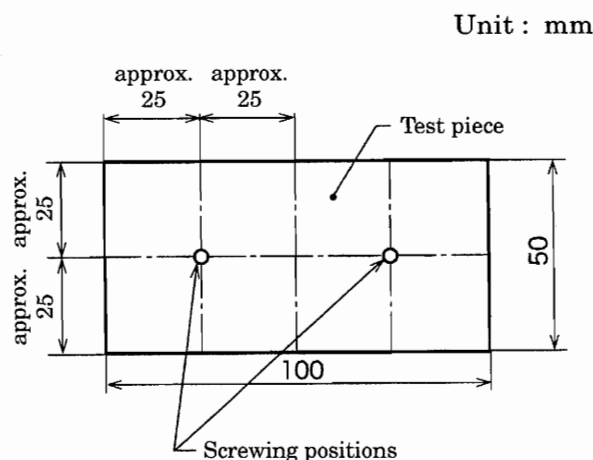


Fig. 8 Test piece for wood screw holding power

6.10 Formaldehyde emission test The formaldehyde emission test shall be carried out on the three boards sampled respectively according to **JIS A 1460**, and the mean value and the maximum value of them shall be regarded as the emission quantity. However, the measured value for two sets of test piece in one sheet of board shall be expressed by two places of significant figure, and the mean value shall be rounded-off to one place of decimal. The mean value of measured values for three boards shall be, also, rounded-off to one place of decimal.

The method to round-off numeral value shall be in accordance with **JIS Z 8401**.

6.11 In-plane tensile strength test Adhere to the centre of the surface of test piece the attachment having the adhering surface of a square whose side is 20 mm or of a circle whose area is 400 mm² by using the adhesive, make a notch of the depth to reach the substrate around the attachment after the adhesive is hardened, fix the test piece and the attachment as shown in Fig. 9, pull them at the load speed of about 2 mm/min in the direction orthogonal to the adhering surface, measure the maximum load (P') at the time of failing force, and calculate the in-plane tensile strength by the formula below:

$$\text{In-plane tensile strength (N/mm}^2\text{)} = \frac{P'}{400}$$

where, P' : maximum load (N) at the time of failing force
400 : area (mm²) of adhered attachment

Unit : mm

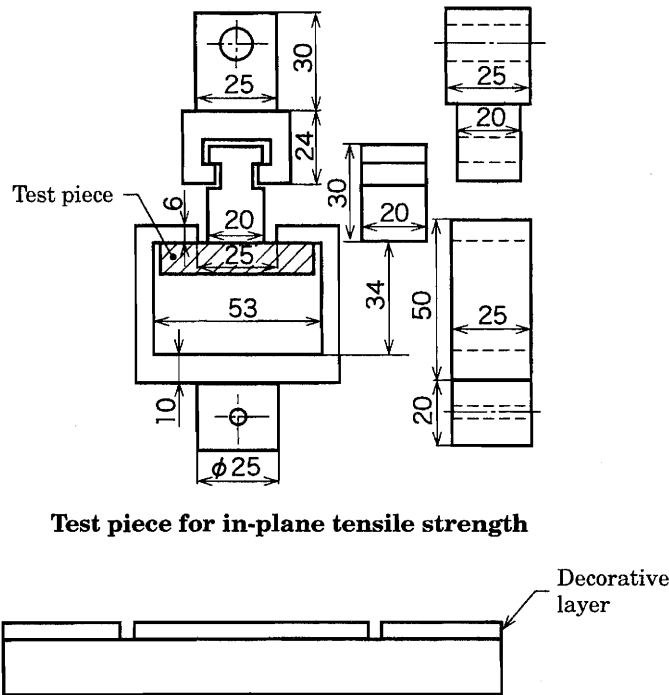


Fig. 9 Test piece for in-plane tensile strength test and attachment

6.12 Impact resistance test Place the test piece of the impact resistance test with its surface upside by the full-support method on the sand as specified in S1 of Table 3 of **5.2 of JIS A 1408**, and drop a spherical weight made of iron and steel as specified in Table 15 onto the centre part of the surface from the prescribed height. Visually observe cracks or fractures on the surface and measure the diameter of the recess.

Table 15 Weight to be used in impact resistance test

Thickness of test piece mm	Weight to be used				Falling height of weight cm
	Symbol	Mass g	Nominal size	Diameter mm	
Under 15	W ₂ -300	Approx. 286	1 $\frac{5}{8}$	Approx. 41	50
15 or over	W ₂ -500	Approx. 530	2	Approx. 51	100

6.13 Acid resistance test Place the test piece horizontally, add several drops of 5 % acetic acid solution⁽¹³⁾ onto the surface, cover the dropped part by a watch glass, and after 2 h, remove the watch glass and immediately wash the surface with water, leave it alone in a room, and visually observe the surface condition after 24 h.

Note ⁽¹³⁾ The acetic acid solution shall be prepared by using acetic acid as specified in **JIS K 8355** or acetic anhydride as specified in **JIS K 8886**.

6.14 Alkali resistance test Place the test piece horizontally, add several drops of 1 % sodium carbonate solution⁽¹⁴⁾ onto the surface, cover the dropped part by a watch glass, and after 2 h, remove the watch glass and immediately wash the surface with water, leave it alone in a room, and visually observe the surface condition after 24 h.

Note ⁽¹⁴⁾ The sodium carbonate solution shall be prepared by using sodium carbonate (10 hydrate) as specified in **JIS K 8624** or sodium carbonate as specified in **JIS K 8625**.

6.15 Stain resistance test Fix the test piece horizontally, place a plate having punched hole parts of 2 cm × 4 cm on the surface thereagainst, and paint the whole surface of the test piece until no decorative surface is found by using a crayon (red) specified in **JIS S 6026**. After leaving alone for 2 h, remove the crayon so as not to damage the decorative layer by a cloth or a nylon brush containing petroleum benzine specified in **JIS K 8594**, and observe it by using a grey scale specified in **JIS L 0805**.

6.16 Change-in-colour resistance test After irradiation for 48 h in accordance with B-1 method of 2 (2.1) of **JIS K 7102** by using a testing machine specified in 3.1 (1) of **JIS K 7102**, visually observe cracks, swells or the like on the surface. Then, leave it alone in a dark place in a relative dry room.

The reference test piece which is not irradiated shall previously be left alone in the same place.

In 2 h or more after irradiation, take the test piece out of the dark place, and measure the change-in-colour by using a grey scale as specified in **JIS L 0804**, or measure the change-in-colour based on the method of $L^*a^*b^*$ colour system as specified in **JIS Z 8730** by using a colorimeter as specified in **JIS K 7102**. However, the change-in-colour shall be judged by the mean value of three colour difference values for the test pieces with graining or other patterns.

Remarks : When a light-and water-exposure apparatus (enclosed carbon-arc type) or a light-and water-exposure apparatus (open-flame sunshine carbon-arc type) is use, the comparative data after irradiation of 48 h of a light-exposure apparatus (enclosed carbon-arc type) shall be confirmed.

6.17 Scratch resistance test Slide the test piece with its surface upside for about 30 mm lengthwise and widthwise by using a scratch tester of Martens type where the diameter of the sphere is 3 mm and the load of the tester is 4.9 N. Carry out the test at three points both lengthwise and widthwise, and then, visually observe the test piece from the position of about 60 cm apart.

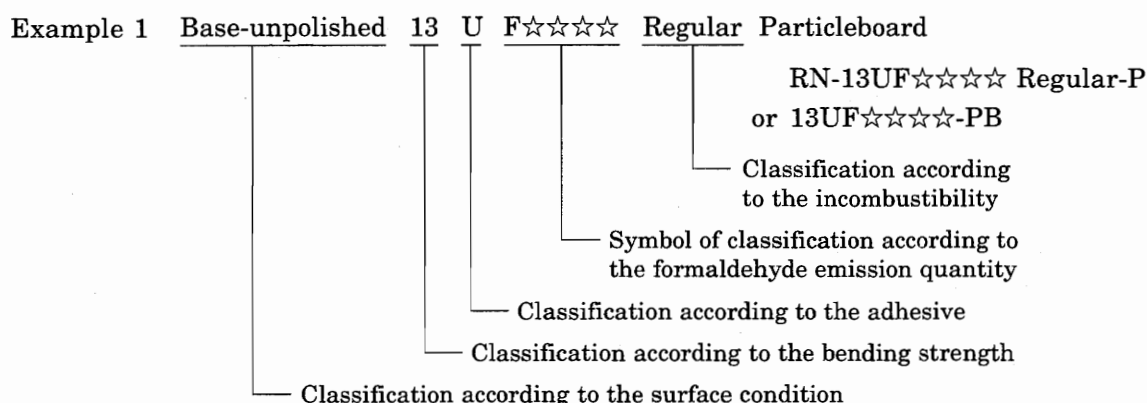
6.18 Thermal insulation test The thermal insulation test shall be made in accordance with **JIS A 1420**, the thermal resistance shall be obtained at the time when the surface temperature is measured at mean temperature of 30 ± 3 °C in the state of upward heat flow direction.

6.19 Incombustibility test The incombustibility test shall be made in accordance with **JIS A 1321**.

7 Inspection The inspection shall be as follows:

- a) The shape, dimensions, appearance and quality shall be inspected by a reasonable inspection method.
- b) The emission quantity of formaldehyde, thermal insulation, acid resistance, alkali resistance, stain resistance, change-in-colour resistance, scratch resistance and incombustibility shall be inspected by the type inspection when the product is newly designed or modified, or when the conditions of production are changed.

8 Designation Designation of the particleboards shall be as specified in the following examples. However, unnecessary items such as the classification according to the face and back, according to the bending strength of the veneered particleboard, and according to the incombustibility may be omitted.



Example 2 Base-polished 18PF☆☆☆ Incombustibility grade 2 Particleboard

RS18PF☆☆☆ Incombustibility grade 2-PB
or 18PF☆☆☆ Incombustibility grade 2-PB

Example 3 Veneered-unpolished 35-15F☆☆ Regular particleboard VNMF☆☆-PB

Example 4 Plastics overlay 13MF☆☆☆☆ Decorative particleboard

DO13MF☆☆☆☆-PB

9 Marking Particleboards shall be marked with the items enumerated below on each product or on each package.

Moreover, for the products for floor substrates, roof substrates, inner and outer wall substrates, the items of the kind (or symbol) of classification according to formaldehyde emission quantity, c) and d) shall be marked for each product.

- a) Classification or symbol
- b) Dimensions (thickness × width × length)
- c) Year and month of manufacture or their abbreviation
- d) Name of manufacturer or its abbreviation
- e) Cautions

Example : Care shall be enough taken of storage because of being in danger of absorbing formaldehyde emitted from other products.

Attached Table 1 Normative references

- JIS A 1321 *Testing method for incombustibility of internal finish material and procedure of buildings*
- JIS A 1408 *Test methods of bending and impact for building boards*
- JIS A 1420 *Determination of steady-state thermal transmission properties—Hot box method*
- JIS A 1460 *Building boards determination of formaldehyde emission—Desiccator method*
- JIS B 1112 *Cross-recessed head wood screws*
- JIS B 7526 *Squares*
- JIS K 7102 *Testing method for colour fastness of plastics upon exposure to light of the carbon arc*
- JIS K 8355 *Acetic acid*
- JIS K 8594 *Petroleum benzine*
- JIS K 8624 *Sodium carbonate decahydrate*
- JIS K 8625 *Sodium carbonate*
- JIS K 8886 *Acetic anhydride*
- JIS L 0804 *Grey scale for assessing change in colour*
- JIS L 0805 *Grey scale for assessing staining*
- JIS S 6026 *Crayons and oil pastels*
- JIS Z 8401 *Guide to the rounding of numbers*
- JIS Z 8730 *Colour specification—Colour differences of object colours*

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